

PATENT COOPERATION TREATY

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NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
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 Office, PCT
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 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 01 November 2000 (01.11.00)	
International application No. PCT/US00/06974	Applicant's or agent's file reference UMJR 1667 PCT
International filing date (day/month/year) 16 March 2000 (16.03.00)	Priority date (day/month/year) 17 March 1999 (17.03.99)
Applicant MA, Peter, X. et al	

1. The designated Office is hereby notified of its election made:



in the demand filed with the International Preliminary Examining Authority on:

28 September 2000 (28.09.00)



in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was

was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Henrik Nyberg Telephone No.: (41-22) 338.83.38
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PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 14 AUG 2001

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Applicant's or agent's file reference UMJR 1667 PC	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US00/06974	International filing date (day/month/year) 16 MARCH 2000	Priority date (day/month/year) 17 MARCH 1999
International Patent Classification (IPC) or national classification and IPC Please See Supplemental Sheet.		
Applicant THE REGENTS OF THE UNIVERSITY OF MICHIGAN		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT)

These annexes consist of a total of 0 sheets

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of report with regard to novelty, inventive step or industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability, citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 10 SEPTEMBER 2000	Date of completion of this report 03 MAY 2001
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer PETER SZEKELY Jean Proctor Paralegal Specialist
Facsimile No. (703) 305-3230	Telephone No. (703) 308-0661

I. Basis of the report1. With regard to the **elements** of the international application: *☒ the international application as originally filed☒ the description:

pages 1-26

pages NONE

pages NONE

, as originally filed

, filed with the demand

, filed with the letter of

☒ the claims:

pages 27-33

pages NONE

pages NONE

pages NONE

, as originally filed

, as amended (together with any statement) under Article 19

, filed with the demand

, filed with the letter of

☒ the drawings:

pages 1-6

pages NONE

pages NONE

, as originally filed

, filed with the demand

, filed with the letter of

☒ the sequence listing part of the description:

pages NONE

pages NONE

pages NONE

, as originally filed

, filed with the demand

, filed with the letter of

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).☐ the language of publication of the international application (under Rule 48.3(b)).☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing☐ contained in the international application in printed form.☐ filed together with the international application in computer readable form.☐ furnished subsequently to this Authority in written form.☐ furnished subsequently to this Authority in computer readable form.☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.4. ☒ The amendments have resulted in the cancellation of:☒ the description, pages NONE☒ the claims, Nos NONE☒ the drawings, sheets/fig NONE5. ☐ This report has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)) **

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/US00/06974

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. statement

Novelty (N)	Claims	<u>8, 16, 17, 26, 30, 31</u>	YES
	Claims	<u>1-7, 9-15, 18-25, 27-29</u>	NO
Inventive Step (IS)	Claims	<u>NONE</u>	YES
	Claims	<u>1-31</u>	NO
Industrial Applicability (IA)	Claims	<u>1-31</u>	YES
	Claims	<u>NONE</u>	NO

2. citations and explanations (Rule 70.7)

Claims 1-7, 9-15, 18-25 and 27-29 lack novelty under PCT Article 33(2) as being anticipated by Tezuka et al., Wilson et al., Okayabashi et al., Engelbrecht or National Res. Dev. Corp.

Tezuka et al. disclose dental glass ionomer, acrylic acid copolymer and polybasic carboxylic acid. Wilson et al. teach ion-leachable aluminosilicate and copolymers of unsaturated carboxylic acid with vinyl hydrocarbon monomers, vinyl ethers or acrylonitrile. Okayabashi et al. recite alkaline earth metal aluminofluorosilicate glass and copolymers of unsaturated carboxylic acids with (meth) acrylic acid esters. Engelbrecht divulges acid reactive fillers and methacrylates of phosphoric acids. National reveals styrene-maleic anhydride copolymer with silicate cement.

Claims 1-31 lack an inventive step under PCT Article 33(3) as being obvious over Tezuka et al., Wilson et al., Okayabashi et al., Engelbrecht or National Res. Dev. Corp.

Although the above references fail to disclose PMMA-MAA copolymer, sulfonic or phosphonic acid replacement of the carboxyl group of the unsaturated carboxylic acids or the polymers of claim 26, Engelbrecht shows that methacrylates of phosphonic acid are usable and Okayabashi et al. list all the possible acids and esters as alternatives.

Claims 1-31 meet the criteria set out in PCT Article 33(4), because dental composites are useful.

----- NEW CITATIONS -----
NONE

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Boxes I - VIII

Sheet 10

CLASSIFICATION:

The International Patent Classification (IPC) and/or the National classification are as listed below:

IPC(7): C08L 33/02, 43/02, 57/06; C08K 3/34; A61K 6/083 and US Cl.: 523/116; 524/443, 494, 547, 556



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : C08L 33/02, 43/02, 57/06, C08K 3/34, A61K 6/083	A1	(11) International Publication Number: WO 00/55253 (43) International Publication Date: 21 September 2000 (21.09.00)
(21) International Application Number: PCT/US00/06974 (22) International Filing Date: 16 March 2000 (16.03.00) (30) Priority Data: 60 124,819 17 March 1999 (17.03.99) US (71) Applicant (for all designated States except US): THE RE- GENTS OF THE UNIVERSITY OF MICHIGAN [US US]; Wolverine Tower, Room 2071, 3003 S. State Street, Ann Arbor, MI 48109-1280 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): MA, Peter, X. [US/US]; 3208 Foxway Court, Ann Arbor, MI 48105 (US), HUBER, Anne, E. [US/US]; 44115 Stassen, Novi, MI 48375 (US). (74) Agents: DESCHERE, Linda, M. et al.; Young & Basile, P.C., Suite 624, 3001 W. Big Beaver Road, Troy, MI 48064-3107 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>
(54) Title: IONOMER COMPOSITE COMPOSITIONS		
(57) Abstract An ionomer composite composition having improved and unique physical properties, includes a glass material containing at least one of divalent cations and multivalent cations; and at least one copolymer. The copolymer comprises: at least one hydrophilic monomer containing acid functional groups adapted to react with the at least one of divalent cations and multivalent cations to form ionic crosslinks among polymer chains, the hydrophilic monomer present in an amount sufficient to impart a desired degree of aqueous solubility to the copolymer; and at least one hydrophobic monomer present in an amount sufficient to impart a desired degree of structural stability to the composite composition when exposed to an aqueous environment.		

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